

reconsideration is respectfully requested in view of the amendments and remarks set forth below.

This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of the claims:

1. (Currently Amended) An isolated polynucleotide that encodes a human β 1A_sodium channel subunit protein, said polynucleotide comprising a ~~member~~ sequence selected from a the group consisting of:

(a) a polynucleotide ~~having at least a 75% identity to a polynucleotide encoding a polypeptide consisting of amino acids 1 to 268 of SEQ.ID.NO.~~ SEQ ID NO:14; and

(b) a polynucleotide ~~having at least 75% identity to a polynucleotide encoding a polypeptide consisting of~~ comprising amino acids 150 to 268 of ~~SEQ.ID.NO.~~ SEQ ID NO:14;

~~—— (c) a polynucleotide which is complementary to the polynucleotide of (a) or (b); and~~

~~—— (d) a polynucleotide comprising at least 15 sequential bases of the polynucleotide of (a), (b), or (c).~~

2. (Original) The polynucleotide of claim 1 wherein the polynucleotide is RNA.
3. (Original) The polynucleotide of claim 1 wherein the polynucleotide is DNA.
4. (Currently Amended) The polynucleotide of claim 1, having a nucleotide sequence selected from a the group consisting of ~~(SEQ.ID.NO. SEQ ID NO:12)~~ and ~~(SEQ.ID.NO. SEQ ID NO:13)~~.
5. (Currently Amended) The polynucleotide of claim 4 ~~further~~ having a nucleotide sequence selected from the group consisting of allelic variants, mutants, and functional derivatives of (SEQ.ID.NO. SEQ ID NO:12) and allelic variants of (SEQ.ID.NO. SEQ ID NO:13).
6. (Currently Amended) The polynucleotide of claim 1, wherein said ~~DNA molecule~~ polynucleotide is genomic DNA.
7. (Currently Amended) An expression vector for expression of a human β 1A sodium channel subunit protein in a recombinant host, wherein said vector contains a recombinant gene

polynucleotide encoding a ~~human~~ β 1A sodium channel subunit protein and functional derivatives thereof SEQ ID NO:14.

8. (Currently Amended) The expression vector of claim 7, wherein the expression vector contains a ~~cloned gene~~ polynucleotide encoding a ~~Human~~ human β 1A sodium channel subunit protein, said polynucleotide having a nucleotide sequence selected from a the group consisting of: ~~(SEQ.ID.NO. SEQ ID NO:12)~~, SEQ ID NO:13, allelic variants of SEQ ID NOs:12 or 13, and (SEQ.ID.NO.:13) functional derivatives of SEQ ID NOs:12 or 13.

9. (Currently Amended) The expression vector of claim 8, wherein the ~~group further consists of allelic variants, mutants, and functional derivatives of~~ nucleotide sequence is SEQ.ID.NO.SEQ ID NO:12 and or SEQ.ID.NO.SEQ ID NO:13.

10. (Currently Amended) The expression vector of claim 7, wherein the expression vector contains genomic DNA encoding a ~~Human~~ human β 1A sodium channel subunit protein of SEQ ID NO:14.

11. (Currently Amended) A ~~recombinant~~ host cell containing a ~~recombinantly cloned gene~~ recombinant polynucleotide encoding a ~~Human~~ human β 1A sodium channel subunit protein of SEQ ID NO:14 or a functional derivative thereof.

12. (Currently Amended) The ~~recombinant~~ host cell of claim 11, wherein said ~~gene~~ polynucleotide has a nucleotide sequence selected from a the group consisting of: ~~(SEQ.ID.NO.:12);~~ SEQ ID NO:12, ~~(SEQ.ID.NO.:13);~~ and SEQ ID NO:13 ~~functional derivatives~~ thereof.

13. (Currently Amended) The ~~recombinant~~ host cell of claim 11, wherein said ~~cloned gene~~ polynucleotide is genomic DNA.

14. (Withdrawn) An isolated protein encoded by a nucleic acid sequence capable of hybridizing under stringent hybridization conditions to a nucleotide sequence having the sequence of SEQ ID NO:12 or SEQ ID NO:13 that when combined with a Human α sodium channel subunit protein in a cell permits sodium ion flux in the cell.

15. (Withdrawn) The protein according to claim 14 , having an amino acid sequence selected from a group consisting of: (SEQ.ID.NO.:14) and functional derivatives thereof.

16. (Withdrawn) A monospecific antibody immunologically reactive with a human β 1A sodium channel subunit protein.

17. (Currently Amended) A process for ~~expression of~~ expressing a ~~Human~~ human β 1A sodium channel subunit protein in a ~~recombinant~~ host cell, comprising:

(a) introducing an expression vector encoding a human β 1A sodium channel subunit protein, into a cell, wherein the vector ~~comprising~~ comprises a nucleic acid sequence capable of hybridizing ~~under stringent hybridization conditions~~ to a nucleotide sequence, ~~or its complementary sequence,~~ having the sequence of SEQ ID NO:12 or SEQ ID NO:13 ~~into a cell, or its complementary sequence,~~ wherein the hybridization conditions comprise incubation in 50% formamide, 6X SSC, 1% SDS at 42 C for 12-19 hours, washing in at least two successive washes at 22 C, followed by stringent washes at 65 C in a buffer of 0.04M sodium phosphate, pH 7.2, 1% SDS and 1mM EDTA;

(b) culturing the cell of step (a) under conditions which allow expression of a protein encoded by the ~~nucleotide sequence~~ expression vector.

18. (Withdrawn) A method of screening for a modulator of sodium channel activity comprising:

(a) providing a cell that co-expresses a protein encoded by a nucleic acid capable of hybridizing under stringent hybridization conditions to a nucleotide sequence, or its complementary sequence, represented by SEQ ID NO:12 or SEQ ID NO:13 and a sodium channel α subunit protein wherein the cell elicits a sodium ion flux;

(b) contacting the cell with a putative β 1A modulating compound; and

(c) measuring a change upon the cell that alters the sodium ion flux.

19. (Withdrawn) The method of claim 18 wherein at least one of the proteins is a recombinant protein.

20. (Withdrawn) The method of claim 18 wherein the change in sodium ion flux is selected a group consisting of:

- (a) increasing the capacity to open the Na channel;
- (b) decreasing the capacity to open the Na channel;
- (c) increasing the rate of desensitization;
- (d) decreasing the rate of desensitization;
- (e) increasing the rate of re-sensitization of the channel;
- (f) decreasing the rate of re-sensitization of the channel;
- (g) increasing the level of $\beta 1A$ protein expression;
- (h) decreasing the level of $\beta 1A$ protein expression;
- (i) increasing the level of the $\alpha/\beta 1A$ complex protein expression; and
- (j) decreasing the level of the $\alpha/\beta 1A$ complex protein expression.

21. (Withdrawn) A compound that modulates the function of human $\beta 1A$ selected using the method of claim 18.

22. (Withdrawn) A pharmaceutical composition comprising a compound of claim 19.

23. (Withdrawn) A method of treating neuropathic pain in a patient in need of such treatment comprising administration of a modulating compound of Claim 21.

24. (Withdrawn) A method of treating neuropathic pain in a patient in need of such treatment comprising altering the level of a human β 1A subunit in a dorsal root ganglia cell in the patient.

25. (Withdrawn) A method of treating chronic pain in a patient in need of such treatment comprising administering the compound of Claim 21.

26. (Withdrawn) A method of treating febrile seizures in a patient in need of such treatment comprising administering the compound of Claim 21.

27. (Withdrawn) A method of treating general epilepsy in a patient in need of such treatment comprising administering the compound of Claim 21.

28. (Withdrawn) An anticonvulsant pharmaceutical composition comprising a compound of claim 21.

29. (Withdrawn) A method of treating arrhythmia in a patient in need of such treatment comprising administering the compound of Claim 21.

30. (Withdrawn) A pharmaceutical composition comprising a compound of claim useful for use as a local anesthetic.

31. (Withdrawn) A method for decreasing neuropathic pain in an individual comprising administering to said individual a modulator of a sodium channel $\beta 1A$ subunit in an amount effective to change the sodium channel activity in said individual.

32. (Withdrawn) The method of claim 31 wherein said modulator decreases the expression of sodium channel $\beta 1A$ subunit in the cells of said individual.

33. (Withdrawn) A method for treating neuropathic pain in a subject comprising altering the level of sodium channel $\beta 1A$ subunits on the surface of a cell in a subject.

34. (Withdrawn) A method for decreasing neuropathic pain in a human comprising the step of administering a sodium channel

β 1A subunit-binding molecule to a sodium channel β 1A subunit-expressing cell in the human.